## ABSTRACT OF THE DISCLOSURE

To determine spectra, integrated multiple illuminant measurements from a non-fully illuminant populated color sensor may be converted into a fully populated spectral curve using a reference database. The reference database is partitioned into a plurality of clusters, and an appropriate centroid is determined for each cluster by, for example, vector quantization. Training samples that form the reference database may be assigned to the clusters by comparing the Euclidean distance between the centroids and the sample under consideration, and assigning each sample to the cluster having the centroid with the shortest Euclidean distance. When all training samples have been assigned, the resulting structure is stored as the reference database. When reconstructing the spectra for new measurements from the sensor, the Euclidean distances between actual color samples under measurement and each cluster centroid are measured. The spectra are then reconstructed using only the training samples from the cluster corresponding to the shortest Euclidean distance, resulting in improved speed and accuracy.